PHYSICS NMDCAT

TOPIC WISE TEST (UNIT–8)

TOPICS:

✓ **Electromagnetism**

Q. 1 **Magnetic effects of current were discovered by:**

A. Faraday
B. Ampere
C. Oersted
D. Joule

Q. 2 **The force acting on a charge q moving with a velocity $\vec{v}$ in a magnetic field of induction $\vec{B}$ is given by:**

A. $q/(\vec{v}\times\vec{B})$
B. $q(\vec{V}\times\vec{B})$
C. $(\vec{v}\times\vec{B})/q$
D. $q(\vec{V}.\vec{B})$

Q. 3 **Which of the following cannot be deflected by a magnetic field?**

A. Alpha rays
B. Gamma rays
C. Beta rays
D. Cosmic rays

Q. 4 **An electron of mass m is accelerated through a potential difference of V and then it enters a magnetic field of induction B normal to the lines. Then the radius of the circular path is**

A. $\sqrt{\frac{2eV}{m}}$
B. $\sqrt{\frac{2Vm}{eB}}$
C. $\sqrt{\frac{2Vm}{eB^2}}$
D. $\sqrt{\frac{2Vm}{e^2B}}$

Q. 5 **Proton and α - particle enter with same velocity at 90^o in a uniform magnetic field. Ratio of radius of their paths will be:**

A. 1 : 2
B. 4 : 1
C. 2 : 1
D. 1 : 4

Q. 6 **Magnetic lines of force:**

A. Cannot intersect at all
B. Intersect only at south and north poles
C. Intersect within the magnet
D. Intersect at neutral point only

Q. 7 **An electron moving east is acted on by a magnetic field in the north direction. The force on the electron is:**

A. Vertically upwards
B. Towards north
C. Vertically downwards
D. Towards east

Q. 8 **A magnetic field exerts a force on a charged particle**

A. Always
B. If it is moving across the magnetic lines of force
C. Never
D. If it is moving along the magnetic lines of force

Q. 9 **A proton is moving with a velocity of 3 x 10^7 m / s in the direction of a uniform magnetic field of 0.5 Tesla. The force acting on proton is.**

A. 2 N
B. 4 N
C. 6 N
D. Zero

Q. 10 If a particle is moving in a region of both electric & magnetic fields then the total force acting on it is.

A. Sum of electric & magnetic force
B. Difference of electric & magnetic force
C. No force will act on it
D. None of above

Q. 11 Magnetic lines of force

A. Always intersect
B. Are always closed
C. Tend to crowd far away from the poles of magnet
D. Do not pass through vacuum

Q. 12 A uniform electric field and a uniform magnetic field are acting along the same direction in a certain region. If an electron is projected along the direction of the fields with a certain velocity then.

A. It will turn towards left of direction of motion
B. Its velocity will increase
C. It will turn towards right of direction of motion
D. Its velocity will decrease

Q. 13 A charged particle of mass m and charge q travels on a circular path of radius r that is perpendicular to a magnetic field B. the time taken by the particle to complete one revolution is

A. $\frac{2\pi m}{qB}$
B. $\frac{2\pi qB}{m}$
C. $\frac{2\pi q^2 B}{m}$
D. $\frac{2\pi mq}{B}$

Q. 14 Two charges are projected in a magnetic field. Their paths after entering field is shown in figure. What type of these charges are?

A. One is proton and other is α-particle
B. One is proton and other is neutron
C. One is electron and other is proton
D. None of these

Q. 15 The unit of $\vec{E}$ is NC^{-1} and that of B is $NA^{-1}m^{-1}$ then the unit of $\frac{E}{B}$ is

A. ms^{-2}
B. ms
C. ms^{-1}
D. $m^{-1}s^{-1}$

Q. 16 If F_1 and F_2 are forces acting on α-particle and electron respectively, when moving perpendicular to the magnetic field then:

A. $F_1=F_2$
B. $F_1>F_2$
C. $F_1<F_2$
D. $F_1=4F_2$

Q. 17 An electron moves in a circular orbit with a uniform speed v. It produces a magnetic field B at the centre of the circle. The radius of the circle is proportional to

A. $\sqrt{\frac{B}{v}}$
B. $\frac{B}{v}$
C. $\sqrt{\frac{v}{B}}$
D. $\frac{v}{B}$

Q. 18 Four particles independently move at the same speed in a direction perpendicular to the same magnetic field. Which particle is deflected the most?

A. A copper ion
B. A helium nucleus
C. An electron
D. A proton

Q. 19 The unit of magnetic flux density is

A. Wbm^{-2}
B. Tesla
C. $NA^{-1}\ m^{-1}$
D. All of these

Q. 20 The magnetic induction B is also called the

A. Flux
B. Density
C. Flux density
D. Tesla

Q. 21 When charge particle enter into a magnetic field then K.E

A. Remain same
B. Increases
C. Decreases
D. None of these

Q. 22 An electron is moving in a circle of radius r in a uniform magnetic field B. suddenly the field is reduced to B/2. The radius of the circle becomes

A. r/2
B. 2r
C. r/4
D. 4r

Q. 23 A uniform magnetic field of 3 G, exists in a + x direction. A proton shoots through the field in the + y-direction with a speed of $5x10^6$ m/s. The magnitude of the force on the proton is

A. 2.4×10^{-16} N
B. 2.4×10^{-6} N
C. 4×10^{-16} N
D. 4 N

Q. 24 The acceleration of an electron of mass *m* and charge *e*, moving with uniform speed *v* at right angles to a magnetic field of flux density *B*, is give by

A. $\frac{Bev}{m}$
B. $\frac{Be}{m}$
C. $\frac{Bv}{m}$
D. Bevm

Q. 25 Frequency of cyclotron depends on

A. m
B. r
C. v
D. All of these

Q. 26 Those particles whose velocity is greater than the magnitude of E/B will deflect towards

A. N–pole
B. South pole
C. $\overrightarrow{F_B}$
D. $\overrightarrow{F_e}$

Q. 27 A proton enters obliquely in a magnetic field. Its path will be

A. Circular
B. Elliptical
C. Parabolic
D. Helix

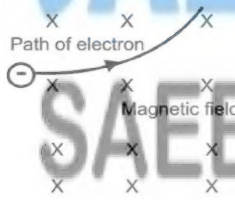
Q. 28 If charge to mass ratio of some particle is increased, then its frequency of cyclotron will:

A. Decrease
B. Remain contact
C. Increase
D. Decrease exponentially

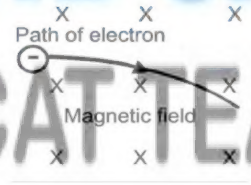
Q. 29 A neutron enters in a magnetic field of strength B (Tesla perpendicular to the magnetic lines of force, with speed v. The force on the neutron is

A. evB
B. Zero
C. ∞
D. $\frac{evB}{2}$

Q. 30 The following diagrams shows an electron passing through a magnetic field. Which diagram shows the possible path of the electrons as they pass through the field?



A.



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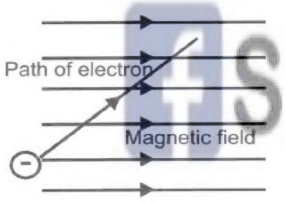

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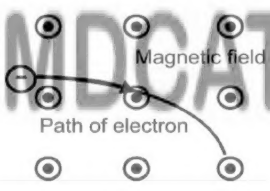
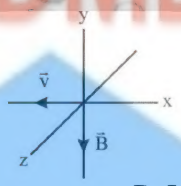


D.

Q. 31 An electron moves in the negative x direction, through a uniform magnetic field in the negative y direction. The magnetic force on the electron is



A. In the negative z direction
B. In the positive z direction
C. In the negative y direction
D. In the positive y direction

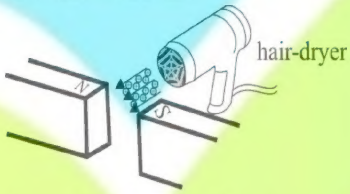
Q. 32 An electron is moving north in a region where the magnetic field is south. The magnetic force exerted on the electron is:

A. West
B. Up
C. Down
D. Zero

Q. 33 Magnetic flux and flux density are related by _____

A. Magnetic flux = area / flux density
B. Magnetic flux = flux density × area
C. Flux density = magnetic flux area
D. Flux density = magnetic flux × area

Q. 34 Hot air from a hair-dryer contains many positively charged ions. The motion of these ions constitutes an electric current.



The hot air is directed between the poles of a strong magnet, as shown.
What happens to the ions? They are deflected

A. Towards the North pole N
B. Downwards
C. Towards the South pole S
D. Upwards

Q. 35 The radius of curvature of the path of the charged particle in a uniform magnetic field is directly proportional to

A. The energy of the particle
B. The intensity of the field
C. The momentum of the particle
D. The charge on the particle

Q. 36 A proton (mass m and charge +e) and an α–particle (mass 4m and charge +2e) are projected with the same kinetic energy at right angles to the uniform magnetic field. Which one of the following statements will be true

A. The α–particle and the proton will be bent in a circular path with the same radius
B. The α–particle and the proton will go through the field in a straight line
C. The α–particle will be bent in a circular path with a small radius that for the proton
D. The radius of the path of the α–particle will be greater than that of the proton

Q. 37 A charged particle moves with velocity v in a uniform magnetic field B. The magnetic force experienced by the particle is

A. Always zero
B. Never zero
C. Zero, if $\vec{B}$ and $\vec{v}$ are perpendicular
D. Zero, if $\vec{B}$ and $\vec{v}$ are parallel

Q. 38 A uniform magnetic field acts at right angles to the direction of motion of electrons. As a result, the electron moves in a circular path of radius 2 cm. If the speed of the electrons is doubled, then the radius of the circular path will be

A. 1 cm
B. 4 m
C. 4.0 cm
D. 0.5 cm

Q. 39 A charge of 1C is moving in a magnetic field of 0.5 tesla with a velocity of 10m/sec perpendicular to the field. Force experienced is

A. 5 N
B. 10N
C. 0.5 N
D. 0N

Q. 40 The magnetic field in a certain region is given by $40\hat{i} - 18\hat{k}$. How much flux passes through a 5.0 cm^2 area loop in this region if loop lies flat in YZ plane?

A. 90×10^{-4} Wb
B. 2×10^{-2} Wb

C. 2×10^{2} Wb
D. 9×10^{-4} Wb

Q. 41 Force on a moving charge in a uniform magnetic field will be maximum, when the angle between $\vec{v}$ and $\vec{B}$ is

A. 0^{o}
B. 30^{o}
C. 60^{o}
D. 90^{o}

Q. 42 The relation for the magnetic flux is given by

A. $\phi_B = \vec{B}.\vec{A}$ B. $\phi_B = \vec{B} \times \vec{A}$

C. $\phi_B = \frac{B}{A}$ D. $\phi_B = BA\ Sin\ \theta$

Q. 43 Direction of magnetic flux is

A. Normal to the surface B. Parallel to the surface

C. At any angle D. No direction

Q. 44 20 Wb magnetic flux passes through the $5m^2$ area of certain sheet, the magnetic flux density would be

A. 2 wb m^{-2} B. 4 wb m^{-2}

C. 6wb m^{-2} D. 8wb m^{-2}

Q. 45 If an electron projected in a magnetic field with a velocity v, it will experience a force given by

A. $\vec{F} = -e\left(\vec{v} \times \vec{B}\right)$ B. $\vec{F} = +e\ \vec{v} \times \vec{B}$

C. $\vec{F} = -e\ \vec{v}.\vec{B}$ D. $\vec{F} = +e\ \vec{v}.\vec{B}$

Q. 46 The charge to mass ratio of an electron is

A. Greater than proton B. Smaller than proton

C. Equal to proton D. Equal to neutron

Q. 47 We cannot determine the e/m ratio of an electron when we are projected the electron _____ to magnetic field

A. Parallel B. Anti-parallel

C. Perpendicular D. Both A and B

Q. 48 The path of electron can be make visible by filling the gas is at

A. High pressure B. Low pressure

C. Not depend on pressure D. High voltage

Q. 49 The necessary condition to make the velocity selector

A. $F_E > F_M$ B. $F_E < F_M$

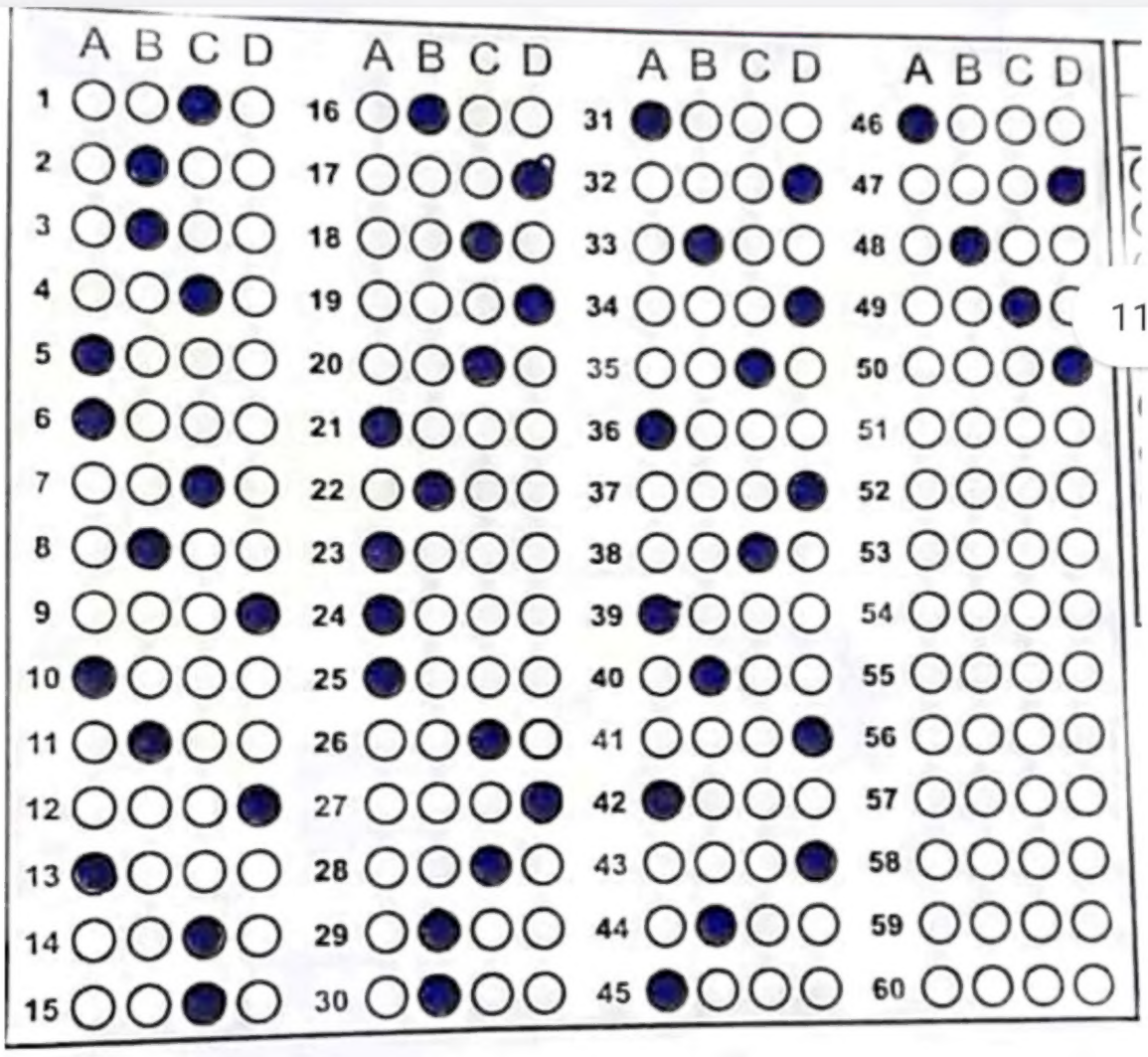
C. $F_E = F_M$ D. $F_E \geq F_M$

Q. 50 If a particle of charge 10^{-12} C moving along the X-direction with a velocity 10^5 m/s experiences a force of 10^{-10} N in y-direction, then the minimum magnetic field is

A. 6.25×10^3 T in the positive z-direction B. 10^{-15} T in the negative Z-direction

C. 10^{-3} T in the positive Z-direction D. 10^{-3} T in the negative Z-direction

Phy T-8



	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
1	○	○	●	○	16	○	●	○	○	31	●	○	○	○	46	●	○	○	○
2	○	●	○	○	17	○	○	○	●	32	○	○	○	●	47	○	○	○	●
3	○	●	○	○	18	○	○	●	○	33	○	●	○	○	48	○	●	○	○
4	○	○	●	○	19	○	○	○	●	34	○	○	○	●	49	○	○	●	○
5	●	○	○	○	20	○	○	●	○	35	○	○	●	○	50	○	○	○	●
6	●	○	○	○	21	●	○	○	○	36	●	○	○	○	51	○	○	○	○
7	○	○	●	○	22	○	●	○	○	37	○	○	○	●	52	○	○	○	○
8	○	●	○	○	23	●	○	○	○	38	○	○	●	○	53	○	○	○	○
9	○	○	○	●	24	●	○	○	○	39	●	○	○	○	54	○	○	○	○
10	●	○	○	○	25	●	○	○	○	40	○	●	○	○	55	○	○	○	○
11	○	●	○	○	26	○	○	●	○	41	○	○	○	●	56	○	○	○	○
12	○	○	○	●	27	○	○	○	●	42	●	○	○	○	57	○	○	○	○
13	●	○	○	○	28	○	○	●	○	43	○	○	○	●	58	○	○	○	○
14	○	○	●	○	29	○	●	○	○	44	○	●	○	○	59	○	○	○	○
15	○	○	●	○	30	○	●	○	○	45	●	○	○	○	60	○	○	○	○

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Regards.Huzaifa Saeed,Usama Sohail